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Science

Essential Soil Science

The fourth edition of
Soil Microbiology,
Ecology and Biochemistry
updates this widely used

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reference as the study and understanding of soil biota, their function, and the dynamics of soil organic matter has been revolutionized by

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molecular and instrumental techniques, and information technology. Knowledge of soil microbiology, ecology and biochemistry is central to our

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understanding of organisms and their processes and interactions with their environment. In a time of great global change and increased emphasis

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on biodiversity and food security, soil microbiology and ecology has become an increasingly important topic. Revised by a group of world-renowned

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authors in many institutions and disciplines, this work relates the breakthroughs in knowledge in this important field to its

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history as well as future applications. The new edition provides readable, practical, impactful information for its many applied and fundamental disciplines.

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Professionals turn to this text as a reference for fundamental knowledge in their field or to inform management practices. New section on "Methods in Studying

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Soil Organic Matter Formation and Nutrient Dynamics" to balance the two successful chapters on microbial and physiological methodology Includes

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expanded information on soil interactions with organisms involved in human and plant disease
Improved readability and integration for an ever-widening audience in his

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field Integrated concepts related to soil biota, diversity, and function allow readers in multiple disciplines to understand the complex soil biota and

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their function

Already renowned as a user-friendly beginners' guide to soil science, *Soil Science Simplified*, 6th Edition is an updated version of the

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beloved textbook that includes even more thorough applications of soil science to interdisciplinary fields. It includes the most recent research

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concerning uses of soil in municipal, engineering, and other areas, conversion agriculture covering no-till, hoe-till, and the methodology of cover

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crops, crop rotations, N contribution, and worldwide trends in conversion agriculture. The experienced authors have fully revised and updated the fundamental

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chapters on physical, chemical, and biological properties to create an ideal introductory text. This book is an unique integrated treatise, on the concepts of

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fractional calculus as models with applications in hydrology, soil science and geomechanics. The models are primarily fractional partial differential

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equations (fPDEs), and in limited cases, fractional differential equations (fDEs). It develops and applies relevant fPDEs and fDEs mainly to water flow and

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solute transport in porous media and overland, and in some cases, to concurrent flow and energy transfer. It is an integrated resource with

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theory and applications for those interested in hydrology, hydraulics and fluid mechanics. The self-contained book summaries the fundamentals for porous

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media and essential mathematics with extensive references supporting the development of the model and applications.

The paradigm and models

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of traditional soil science lack the ability to adequately address issues of soil dynamics, environmental integration, and change. Unexplainable research

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results obtained from traditional soil studies applied to non-traditional soil phenomena in physical geography, archaeology and ecology speak to the

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current need for soil science to move beyond description and classification and into a dynamic process-oriented soil science capable of providing

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explanations. Soils do not behave as static inert geologic detritus affected by climate, organisms, relief, and parent material through time, but instead soils

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behave as self-organizing systems dynamically interrelating with their environment. Recognition of this dynamic behaviour required a re-

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examination of how scientists in general think and in how modern soil science specifically evolved its basic paradigms and models. This book

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examines the dynamics of soil organic carbon and demonstrates the self-organizing nature of soil through time as soil responds to a wide range of environmental

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and human perturbations. Makes soil science accessible to a wider audience by integrating soil science with biology, geography and archaeology Demonstrates

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universal application by including case studies from around the world Avoids pitfalls of determinism and vitalism by being well founded in the philosophy of

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science

The Soil as a Natural
Resource

An Introduction to
Applications

Advances in Agronomy
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Topics for the
Commercial and Backyard
Crop Producer
Concepts, Software,
Applications
Essential Soil Science

This publication is for the gardener who

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wants to gain a more thorough understanding of soil basics, including soil components, texture, structure, water permeability and chemistry. There is also information on soil fertility and plant nutrients.

*Build healthy soil and grow better plants
Robert Pavlis, a gardener for over four*

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decades, debunks common soil myths, explores the rhizosphere, and provides a personalized soil fertility improvement program in this three-part popular science guidebook. Healthy soil means thriving plants. Yet untangling the soil food web and optimizing your soil health is beyond most gardeners, many of whom lack an in-

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depth knowledge of the soil ecosystem. Soil Science for Gardeners is an accessible, science-based guide to understanding soil fertility and, in particular, the rhizosphere – the thin layer of liquid and soil surrounding plant roots, so vital to plant health. Coverage includes: Soil biology and chemistry and

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how plants and soil interact Common soil health problems, including analyzing soil's fertility and plant nutrients The creation of a personalized plan for improving your soil fertility, including setting priorities and goals in a cost-effective, realistic time frame. Creating the optimal conditions for nature to do the heavy lifting of building

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soil fertility Written for the home gardener, market gardener, and micro-farmer, *Soil Science for Gardeners* is packed with information to help you grow thriving plants.

This textbook is aimed at the majority of students, who need to quickly acquire a concise overview of soil science. Many

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current soil science textbooks still cater for a traditional student market where students embark on three years study in a narrow discipline. The growth in modular degree schemes has meant that soil science is now often taught as self-standing unit as part of broad based degree program. Students pursuing this type of course

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are increasingly reluctant to purchase expensive textbooks that are too detailed and often assume a scientific background. For those opting to specialise in soil science there are a variety of good textbooks to choose from. This short informative guide, will be particularly useful for students who do not

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possess a traditional scientific background, such as those studying geography, environment science, ecology and agriculture. Only textbook to cater for introductory courses in soil science. Provides an affordable concise overview of soil science. Learning exercises and chapter summaries enhance usability.

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Annotated suggestions for further reading. Based on proven and successful modular course structure. Emphasis on readability and interactive learning. No scientific background assumed.

Globally, 30% of the world population lived in urban areas in 1950, 54% in 2016 and 66% projected by 2050. The most

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urbanized regions include North America, Latin America, and Europe. Urban encroachment depletes soil carbon and the aboveground biomass carbon pools, enhancing the flux of carbon from soil and vegetation into the atmosphere. Thus, urbanization has exacerbated ecological and environmental problems. Urban soils

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are composed of geological material that has been drastically disturbed by anthropogenic activities and compromised their role in the production of food, aesthetics of residential areas, and pollutant dynamics. Properties of urban soils are normally not favorable to plant growth—the soils are contaminated by

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heavy metals and are compacted and sealed. Therefore, the quality of urban soils must be restored to make use of this valuable resource for delivery of essential ecosystem services (e.g., food, water and air quality, carbon sequestration, temperature moderation, biodiversity). Part of the Advances in Soil Sciences

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Series, Urban Soils explains properties of urban soils; assesses the effects of urbanization on the cycling of carbon, nitrogen, and water and the impacts of management of urban soils, soil restoration, urban agriculture, and food security; evaluates ecosystem services provisioned by urban soils, and describes

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synthetic and artificial soils.

Fundamentals of Soil Science

Soil Science Simplified

Managing Alaska Soils

Analysis and Instrumentation

Soil Science for Gardeners

Fractional Calculus for Hydrology, Soil

Science and Geomechanics

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This book was born as an international tribute to Fiorenzo C. Ugolini, an outstanding soil scientist, now retired from university teaching and research. It is a synthesis of the knowledge of soils, their genesis,

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functions and management, and includes contributions from leading soil scientists. It provides the basic concepts as well as data and practical examples from across the discipline. The book also discusses the

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increasingly important role of soils in enabling the preservation of life and contains a rare attempt to cross-harmonize the Soil Groups of the World Reference Base of Soil Resources with the Orders of

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the Soil Taxonomy. It also considers the possible existence of extraterrestrial soils based on the findings from the last space missions. This volume will be a valuable resource for researchers and

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students of soil science, soil conservation, geography and landscape ecology.

Despite its many origins in agronomic problems, statistics today is often unrecognizable in this context. Numerous recent

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methodological approaches and advances originated in other subject-matter areas and agronomists frequently find it difficult to see their immediate relation to questions that their disciplines raise. On the

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other hand, statisticians often fail to recognize the riches of challenging data analytical problems contemporary plant and soil science provides. The first book to integrate modern statistics with crop, plant

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and soil science, Contemporary Statistical Models for the Plant and Soil Sciences bridges this gap. The breadth and depth of topics covered is unusual. Each of the main chapters could be a textbook

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in its own right on a particular class of data structures or models. The cogent presentation in one text allows research workers to apply modern statistical methods that otherwise are scattered across several

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specialized texts. The combination of theory and application orientation conveys *why* a particular method works and *how* it is put in to practice. About the downloadable resources The accompanying

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downloadable resources are a key component of the book. For each of the main chapters additional sections of text are available that cover mathematical derivations, special topics, and supplementary

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applications. It supplies the data sets and SAS code for all applications and examples in the text, macros that the author developed, and SAS tutorials ranging from basic data manipulation to advanced programming

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techniques and publication quality graphics.

Contemporary statistical models can not be appreciated to their full potential without a good understanding of theory.

They also can not be applied

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to their full potential without the aid of statistical software.

Contemporary Statistical Models for the Plant and Soil Science provides the essential mix of theory and applications of statistical

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methods pertinent to research in life sciences. This book is primarily written for students of borderline sciences for whom knowledge of the fundamentals of soil science is absolutely essential.

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These students are, very frequently, confronted with books which are far too foreign in outlook and background, and cannot afford the beginner a picture of the soil that he can view in the light of his

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own familiarity with objects of everyday life. The intelligent layman who has an interest or stake in the soil will find this book free from technicalities, even an elementary knowledge of chemistry is not assumed.

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Improvement of soil is the basis of all agriculture and it is hoped that this book besides its text book appeal will help in the awakening of that mass interest in the soil which ultimately must lead to a more intelligent

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use of nature's most abundant gift to mankind.

CONTENTS * FUNDAMENTAL LAWS OF CHEMISTRY * CHEMISTRY OF THE SOIL * SALTS IN THE SOIL * PHYSICS OF THE SOIL FRAMEWORK * MOISTURE IN SOILS * SOIL MECHANICS *

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SOIL FERTILITY

This study looks at the fundamentals of soil science and soil biology, encompassing topics such as the building blocks of the soil system and bioremediation of

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contaminated soils.

Sustainable Production and
Environmental Protection

An Introduction to Soil
Processes, Functions,

Structure and Mechanics

A Hidden World Underground

An Elementary Textbook

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Plant & Soil Science:

Fundamentals & Applications

Biochar Application

Discover how to plan, conduct, and interpret field research with this essential new guidebook Good field research is the driving force behind advancement in the agronomic,

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environmental, and soil sciences. Nevertheless, many undergraduate and graduate scientists have limited opportunity to develop hands-on experience before undertaking projects in the field. With Fieldwork Ready, Dr Sara Vero maps out the fundamental principles, methods,

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and management techniques that underpin this crucial practice, offering trainee researchers an accessible introduction to the world of on-site investigation. This instructive text includes: Guidance on the essential aspects of environmental monitoring and soil,

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**water, plant, and wildlife research
Insights into the methods behind
experiment planning and effective
fieldwork Tips for team
management and safety
Explanations of how to select and
correctly use soil sampling
equipment Offering new**

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researchers a primer that is practical and easy to follow, Fieldwork Ready is the ideal starting point for all those beginning a career in the agricultural sciences.

Essential Soil Science A Clear and Concise Introduction to Soil

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ScienceJohn Wiley & Sons
Interacting Processes in Soil Science focuses on coupled processes in soil. Topics covered in this important volume include the effects of inorganic salts upon water flow, modeling of sorption, transport and transformation of

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organic solutes, and the effects of microorganisms on silicate clay minerals. The book presents studies and approaches that can be extended and complemented by innovative work in the future. Interacting Processes in Soil Science will be an essential

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reference for all researchers and students in soil science, soil and water engineering, civil and environmental engineering, earth sciences, and hydrology.

Geomorphometry is the science of quantitative land-surface analysis. It draws upon mathematical,

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statistical, and image-processing techniques to quantify the shape of earth's topography at various spatial scales. The focus of geomorphometry is the calculation of surface-form measures (land-surface parameters) and features (objects), which may be used to

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improve the mapping and modelling of landforms to assist in the evaluation of soils, vegetation, land use, natural hazards, and other information. This book provides a practical guide to preparing Digital Elevation Models (DEM) for analysis and extracting land-surface

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parameters and objects from DEMs through a variety of software. It further offers detailed instructions on applying parameters and objects in soil, agricultural, environmental and earth sciences. This is a manual of state-of-the-art methods to serve the various researchers

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who use geomorphometry. Soil scientists will use this book to further learn the methods for classifying and measuring the chemical, biological, and fertility properties of soils and gain a further understanding of the role of soil as a natural resource.

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Geologists will find value in the instruction this book provides for measuring the physical features of the soil such as elevation, porosity, and structure which geologists use to predict natural disasters such as earthquakes, volcanoes, and flooding. * Technical details on a

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variety of software packages allow researchers to solve real-life mapping issues * Provides soil and agronomy researchers best practice techniques for soil data analysis to assist in enhanced land-use and planning * Offers geologists essential tactics for better

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environmental management by providing a comprehensive analysis of the physical features of soil *
Companion website includes access to the latest technological advancements previously unpublished in any other comprehensive source:

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geomorphometry software, DEM data sources, and applications

Urban Soils

Principles and Practice of Soil Science

Genesis and Geomorphology

Soil Mapping and Process Modeling for Sustainable Land Use

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Management

Explorations Into a Dynamic

Process-Oriented Soil Science

Soil Conditions and Plant Growth

Approaches to Soil Health

Analysis A concise survey of

soil health analysis and its

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various techniques and applications The maintenance of healthy soil resources provides the foundation for an array of global efforts and initiatives that affect humanity. Whether they are working to

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combat food shortages, conserve our ecosystems, or mitigate the impact of climate change, researchers and agriculturalists the world over must be able to correctly examine and understand the

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complex nature of this essential, fragile resource. These new volumes have been designed to meet this need, addressing the many dimensions of soil health analysis in chapters that are

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concise, accessible and applicable to the tasks at hand. Soil Health, Volume One: Approaches to Soil Health Analysis provides a well-rounded overview of the various methods and

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strategies available to analysts, and covers topics including: The history of soil health and its study Challenges and opportunities facing analysts Meta-data and its assessment

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Applications to forestry and urban land reclamation Future soil health monitoring and evaluation approaches Offering a far-reaching survey of this increasingly interdisciplinary field, this

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volume will be of great interest to all those working in agriculture, private sector businesses, non-governmental organizations (NGOs), academic-, state-, and federal-research projects, as well as

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state and federal soil conservation, water quality and other environmental programs.

Biochar Application: Essential Soil Microbial Ecology outlines the cutting-edge

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research on the interactions of complex microbial populations and their functional, structural, and compositional dynamics, as well as the microbial ecology of biochar application to soil, the use of different

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phyto-chemical analyses, possibilities for future research, and recommendations for climate change policy. Biochar, or charcoal produced from plant matter and applied to soil, has

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become increasingly recognized as having the potential to address multiple contemporary concerns, such as agricultural productivity and contaminated ecosystem amelioration, primarily by

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removing carbon dioxide from the atmosphere and improving soil functions. Biochar Application is the first reference to offer a complete assessment of the various impacts of biochar on soil and

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ecosystems, and includes chapters analyzing all aspects of biochar technology and application to soil, from ecogenomic analyses and application ratios to nutrient cycling and next generation

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sequencing. Written by a team of international authors with interdisciplinary knowledge of biochar, this reference will provide a platform where collaborating teams can find a common resource to establish

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outcomes and identify future research needs throughout the world. Includes multiple tables and figures per chapter to aid in analysis and understanding Includes a comprehensive table of the methods used

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within the contents, ecosystems, contaminants, future research, and application opportunities explored in the book Includes knowledge gaps and directions of future research

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to stimulate further discussion in the field and in climate change policy Outlines the latest research on the interactions of complex microbial populations and their functional, structural, and

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compositional dynamics

Offers an assessment of the impacts of biochar on soil and ecosystems

Trace elements occur naturally in soils and some are essential nutrients for plant growth as

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well as human and animal health. However, at elevated levels, all trace elements become potentially toxic. Anthropogenic input of trace elements into the natural environment therefore poses a

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range of ecological and health problems. As a result of their persistence and potential toxicity, trace elements continue to receive widespread scientific and legislative attention. Trace

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Elements in Soils reviews the latest research in the field, providing a comprehensive overview of the chemistry, analysis, fate and regulation of trace elements in soils, as well as remediation strategies for

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contaminated soil. The book is divided into four sections: • Basic principles, processes, sampling and analytical aspects: presents an overview including general soil chemistry, soil sampling,

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analysis, fractionation and speciation. • Long-term issues, impacts and predictive modelling: reviews major sources of metal inputs, the impact on soil ecology, trace element deficient soils and

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chemical speciation modelling. • Bioavailability, risk assessment and remediation: discusses bioavailability, regulatory limits and cleanup technology for contaminated soils

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including phytoremediation and trace element immobilization. •

Characteristics and behaviour of individual elements Written as an authoritative guide for scientists working in soil

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science, geochemistry, environmental science and analytical chemistry, the book is also a valuable resource for professionals involved in land management, environmental planning, protection and

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regulation.

Have you ever wondered what happens in the earth underneath us? James has, and he wants to learn more about soil. In Exploring Soils: A Hidden World Underground,

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James discovers that soil is not just dirt for digging in. He explores how plants and animals live in soil, how soils are formed, how they differ, and the ways that soil is essential in our lives. Written

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by Samantha Grover, a soil scientist and parent, and with engaging illustrations by artist Camille Heisler, Exploring Soils will take you to an underground world filled with activity and discoveries.

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Perfect for ages 6 – 9.

***Interacting Processes in Soil
Science***

***Contemporary Statistical
Models for the Plant and Soil
Sciences***

Geomorphometry

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The Living Soil Handbook of Soil Science Essential Soil Microbial Ecology

Principles and Practice of Soil Science, Fourth Edition provides a current and comprehensive

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introduction to soil science for students in the fields of environmental and agricultural science, ecology, soil and land management, natural resource management and environmental engineering.

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Covers all aspects of soil science including soil habitat, processes in the soil environment and soil management. Emphasizes the applications of soil science to the solution of practical

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problems in soil and land management. Highlights real world examples drawn from the author's international experience in the field. Includes an expanded colour section of soil profiles and other features,

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and greater coverage of international soil classification. Features new problem sets and questions at the end of each chapter, designed to reinforce important principles. An answer key is provided at the

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end of the text. Artwork from the book is available to instructors online at www.blackwellpublishing.com/white Building on the extremely successful and popular Russell's Soil Conditions and Plant

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Growth, Wiley-Blackwell is pleased to publish this completely revised and updated edition of the soil science classic. Covering all aspects of the interactions between plant and soil, Peter Gregory

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and Stephen Nortcliff, along with their team of internationally-known and respected authors, provide essential reading for all students and professionals studying and working in

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agriculture and soil science. Subject areas covered range from crop science and genetics; soil fertility and organic matter; nitrogen and phosphorus cycles and their management; properties and management of

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plant nutrients; water and the soil physical environment and its management; plants and change processes in soils; management of the soil/plant system; and new challenges including food, energy and

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water security in a changing environment. Providing a very timely account on how better to understand and manage the many interactions that occur between soils and plants, Soil Conditions and Plant Growth is

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sure to become the book of choice - as a recommended text for students and as an invaluable reference for those working or entering into the industry. An essential purchase for all universities and research

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establishments where agricultural, soil, and environmental sciences are studied and taught.

Soil Mapping and Process Modeling for Sustainable Land Use Management is the first

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reference to address the use of soil mapping and modeling for sustainability from both a theoretical and practical perspective. The use of more powerful statistical techniques are increasing the accuracy of

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maps and reducing error estimation, and this text provides the information necessary to utilize the latest techniques, as well as their importance for land use planning. Providing practical

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examples to help illustrate the application of soil process modeling and maps, this reference is an essential tool for professionals and students in soil science and land management who want to

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bridge the gap between soil modeling and sustainable land use planning. Offers both a theoretical and practical approach to soil mapping and its uses in land use management for sustainability

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Synthesizes the most up-to-date research on soil mapping techniques and applications
Provides an interdisciplinary approach from experts worldwide working in soil mapping and land management

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The Handbook of Soil Science provides a resource rich in data that gives professional soil scientists, agronomists, engineers, ecologists, biologists, naturalists, and their students a handy reference

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about the discipline of soil science. This handbook serves professionals seeking specific, factual reference information. Each subsection includes a description of concepts and theories; definitions;

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approaches; methodologies and procedures; tabular data; figures; and extensive references.

Working with Nature to Build Soil Health

Fieldwork Ready

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Soils: Basic Concepts and
Future Challenges

Scheffer/Schachtschabel Soil
Science

Trace Elements in Soils

Exploring Soils

The soils are fundamental to

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our existence, delivering water and nutrients to plants, that feed us. But they are in many ways in danger and their conservation is therefore a most important focus for science, governments and

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society as a whole. A team of world recognised researchers have prepared this first English edition based on the 16th European edition. • The precursors and the processes of soil development • The physical,

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biological and chemical properties of soils • Nutrients and Pollutants • The various soil classifications with the main focus on the World Reference Base for Soil Resources (WRB) • The most

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important soils and soil landscapes of the world • Soil Evaluation Techniques • Basic Principles of Soil Conservation Whoever works with soils needs this book. This book is an introduction to soil science and

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describes the development of soils, their characteristics and material composition, and their functions in terrestrial and aquatic environments. Soil functions include the delivery of goods and services for human

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society, such as food, clean water, and the maintenance of biodiversity. This concise yet comprehensive text is supplemented throughout with colour illustrations, diagrams, and tables. It is ideal reading

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for all those looking to understand soils, their functions, their importance in terrestrial and aquatic environments, and their contribution to the development of human society. It will provide a

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valuable resource for teachers, practitioners, and students of soil science, agriculture, farming, forestry, gardening, terrestrial and aquatic ecology, and environmental engineering.

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Soil Science Simplified, Fifth Edition is a significant update and revision of the classic introductory soils text. The new edition includes greater coverage of non-agricultural uses of soils ranging from

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municipal to engineering uses, as well as an expanded discussion of environmental uses of soils and soil conservation. In addition, the chapters covering the basic scientific aspects of soil from its physical,

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chemical and biological properties to basic formation will be thoroughly revised and updated. Soil Science Simplified will serve as a valuable introduction to soil science that addresses many new

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developments to this ever-changing field while maintaining the elements that have made it a user-friendly introductory text for more than 25 years. This text will be essential reading for anyone studying

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soil science as well as professionals working with this valuable resource.

Plant & Soil Science

Fundamentals and

Applications combines the basic knowledge of plant and soil science, in an easy to

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read and teach format, and provides practical real world application for information learned.

Important Notice: Media content referenced within the product description or the product text may not be

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available in the ebook version.

Principles of Soil Chemistry, Fourth Edition
A Clear and Concise Introduction to Soil Science
Fundamentals of Soil Science and Soil Biology

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Essentials of Soil Science
Fundamentals of Soil Ecology
Applied Soil Chemistry

"Designed for use by students studying soil science as part of degree and diploma courses"--Back cover.

This book explores the state-of-the-art information regarding applied soil

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sciences. It covers the fundamentals, model concepts, principles, chemical reactions, functions, chemical recycling, chemical weathering, acid-base chemistry, carbon sequestration, and nutrient availability of soils. Also, it includes soil chemistry of heavy-metals, environment, clay, ion-

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exchange processes, analytical tools and applications. This book helps to understand the about soil characteristics targeting soil chemical reactions and interactions and its applications.

Soils are one of the world's most important resources, and their

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protection, maintenance, and improvement is critical to the continuance of life on earth. Soil Fertility, Second Edition, offers thorough coverage of the fertility, composition, properties, and management of soils. This book carries on the tradition of excellence

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established by authors Henry Foth and Boyd Ellis, leading soil scientists whose previous books in this field have become multi-edition classics. The Second Edition of Soil Fertility has been significantly expanded to include more information on mineralogy, while keeping the thorough coverage of

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essential topics. The book presents soils as dynamic, constantly changing bodies, and relates soil fertility and management to the mineralogy of their origin. Four new chapters offer updated information on soil charge properties, ion adsorption, exchange and fixation, and soil reaction. There is

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also a far greater emphasis on environmental issues, reflecting the increasing importance of environmental concerns to agronomists and soil scientists today. *Advances in Agronomy* continues to be recognized as a leading reference and a first-rate source of the latest

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research in agronomy. Major reviews deal with the current topics of interest to agronomists, as well as crop and soil scientists. As always, the subjects covered are varied and exemplary of the myriad subject matter dealt with by this long-running serial. Editor Donald Sparks, former president of the Soil

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Science Society of America and current president of the International Union of Soil Science, is the S. Hallock du Pont Chair of Plant and Soil Sciences at The University of Delaware. Volume 82 contains eight state-of-the-art reviews on topics of interest in the plant and soil sciences.

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Three of the reviews present cutting-edge molecular scale techniques and approaches that directly impact food production, crop improvement, and environmental quality and sustainability.

Approaches to Soil Health Analysis,
Volume 1

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Soil Phosphorus

Soil Science

Soil Formation, Functions, Use and Classification (World Reference Base, WRB)

An Introductory Guide to Field Research for Agriculture, Environment,

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and Soil Scientists

Soils are the porous skin of the Earth with variable and complex structures composed of solid, liquid and gaseous phases. This textbook (based on the 4th, German language edition) introduces the

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reader gently but comprehensively to soil physical processes. The authors discuss both the origin and dynamics of soil physical properties and functions -- including volume-mass relations of the

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solid, water and gas phases, grain and pore size distributions, permeability and storage capacity for water, gases and heat -- and finally soil deformation and strength in relation to mechanical and hydraulic

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stresses resulting in structural changes through compaction, kneading, slaking and soil crusting. Phosphorus is an essential plant nutrient, but global population growth has dramatically reduced the

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availability of phosphorus fertilizer resources.

Despite this scarcity, there remain numerous problems associated with the excessive and inappropriate use of phosphorus leading to non-point source pollution

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and eutrophication of natural waters. Identifying appropriate systems for managing soil phosphorus and reducing the risks of eutrophication are needed to minimize the environmental risks. This book focuses on

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the availability and recycling of phosphorus; regulatory and policy issues of sustainable phosphorus use; and water quality management in agroecosystems pertaining to phosphorus. Sections are dedicated to

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global phosphorus reserves; cycling and pathways of phosphorus; phosphorus in agriculture; human dimensions and policy intervention; and research and development priorities. Phosphorus is a finite but

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crucial resource and is an essential element to all life. Sub-optimal availability and nutrient imbalance in the root zone can adversely impact plant growth, and the quality of food and feed grown on these

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soils. However, the proven reserves of phosphorus can hardly be adequate for a few centuries only. Yet, its misuse and mismanagement has caused severe problems of eutrophication of water and pollution of the

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environment. Thus, judicious management of soil phosphorus is essential.

This volume is specifically devoted to availability and recycling of phosphorus, regulatory/policy issues of sustainable use of

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phosphorus, and management in agroecosystems in the context of maximizing the use efficiency and minimizing the environmental risks of water quality. This fully revised and expanded edition of

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Fundamentals of Soil Ecology continues its holistic approach to soil biology and ecosystem function. Students and ecosystem researchers will gain a greater understanding of the central roles that soils play in

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ecosystem development and function. The authors emphasize the increasing importance of soils as the organizing center for all terrestrial ecosystems and provide an overview of theory and practice of soil

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ecology, both from an ecosystem and evolutionary biology point of view. This volume contains updated and greatly expanded coverage of all belowground biota (roots, microbes and fauna) and methods to identify and

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determine its distribution and abundance. New chapters are provided on soil biodiversity and its relationship to ecosystem processes, suggested laboratory and field methods to measure biota and their

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*activities in ecosystems..
Contains over 60% new
material and 150 more pages
Includes new chapters on
soil biodiversity and its
relationship to ecosystem
function Outlines suggested
laboratory and field methods*

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Incorporates new pedagogical features Combines theoretical and practical approaches

The Encyclopedia of Soil Science provides a comprehensive, alphabetical treatment of basic soil

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science in a single volume. It constitutes a wide ranging and authoritative collection of some 160 academic articles covering the salient aspects of soil physics, chemistry, biology, fertility, technology,

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genesis, morphology, classification and geomorphology. With increased usage of soil for world food production, building materials, and waste repositories, demand has grown for a better

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global understanding of soil and its processes. longer articles by leading authorities from around the world are supplemented by some 430 definitions of common terms in soil sciences.

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Soils

Soil Fertility

Encyclopedia of Soil Science

*Soil Microbiology, Ecology
and Biochemistry*

Introduction to Soil

Chemistry

Essential Soil Physics

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***Designed As A Text Book,
But Equally Useful As A
Reference Source For
Scholars And Others, This
Book Offers All The
Necessary And Desired
Information About Soils And***

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Their Culture. Beginning With Classification Of Soils And Their Physical And Chemical Properties, It Deals Systematically With All Such Topics As Soil Acidity, Soil Moisture, Soil Organisms,

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***Accumulation Of Organic
Matter In Soils, Effect Of
Manures And Fertilizers On
Soil, Soil Fertility
Maintenance And
Development And
Management Of Alkali Soils.***

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Soil Requirements For Specific Fruit Crops Have Also Been Discussed. On The Whole The Book Introduces The Reader To Soil As Natural Entities And Their Inherent Characteristics;

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Explains The Basic Relationship Between Soils And Plants; And Gives A Clear Understanding About The Fundamental Principles Involved In The Use Of Soil Management Practices. An

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Of The Book. Chapter 1: Soil
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Material From Which Soils***

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***Are Developed,
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Minerals From Which Soils
Are Derived, Chemical And
Physical Processes Active In
Soil Development, Biological
Agencies Which Aid In Soil***

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Results Of Mineral-
Decomposing Processes,
Constructive Processes Of
Soil Development, The Soil
Profile, Chapter 2:
Classification Of Soils; A***

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***Textural Classification Of
Soils, A Systematic
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Parent Material In Relation To Soil Groups, Soil Groups In Relation To Vegetative Cover, Soil Groups In Relation To Population Density And Production Of Agricultural Products,

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Chapter 3: Physical And Chemical Properties Of Soils; Making A Mechanical Analysis, Properties Of Soil Separates, Soil Structure, Tillage Operations And Soil Properties, Porosity And

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Weight Of Soil, Soil Color, Soil Temperature, Chapter 4: Soil Reaction; Soil Acidity And Conditions Giving Rise To Acid Soils, Conditions In Acid Soils Which Are Beneficial Or Detrimental To

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***The Growth Of Plants,
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And Effect On Plants Of
Neutral And Alkaline Soils,
Chapter 5: Lime And Its Use;
The Need Of Soils For Lime,
Functions Of Lime In The***

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Soil, Forms Of Lime, Lime Guarantees, Sources Of Lime, The Use Of Lime, Chapter 6: Soil Moisture; Soil Water Which Yields To The Pull Of Gravity, Soil Water Which Is Retained

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***Against The Pull Of Gravity,
Water In Relation To Plant
Growth, Loss Of Moisture
From The Soil, Runoff Water,
Chapter 7: Soil Organisms:
Their Relation To Soils And
Soil Productivity; Nature***

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And Extent Of The Soil Population, Activities Of Soil Microbes In Relation To The Growth Of Higher Plants, The Role Of Microorganisms In The Development Of Soils, Interrelationship Between

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Higher Plants And Soil Microorganisms And Among Soil Microorganisms Themselves, Chapter 8: Soil Organic Matter: Organic Matter Accumulation In Soils, Effects Of Organic

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***Matter On Soil Productivity,
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***The Effects Of Cover And
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Utilization Of Cover And
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With Manure, Methods Of
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Manure, Effects Of Manure
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Nutrient Requirement Of
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Plants, Effects Of Nitrogen***

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***Phosphorus And Potassium
On Plants And The
Quantities Removed By
Crops, Determining Soil-
Nutrient Deficiencies,
Chapter 12: Fertilizers And
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***Fertilizing Materials
Supplying Nitrogen,
Phosphatic Fertilizer
Materials, Potassium
Fertilizers, Mixed Fertilizers,
Chapter 13: Fertilizer
Practices; Effects Of***

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Fertilizers On Soils, Effects Of Fertilizers On Crops, Laws Controlling Fertilizer Sales, Home Mixing Fertilizers, The Purchase And Use Of Fertilizers, Chapter 14: Soil Fertility Maintenance And

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***Productivity Rating Of Soil;
Maintaining Soil Fertility,
Soil Productivity Rating And
Land Classification, Chapter
15: Soils And Agriculture Of
Arid Regions; Characteristics
And Utilization Of Soil In***

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Arid Regions, Development And Management Of Alkali Soils, Chapter 16: Irrigation; Water Supply And Land For Irrigation, Irrigation Practice, Chapter 17: Fruit Soils; Selecting A Site For A

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Fruit Enterprise, Soil Requirements Of Specific Fruit Plants, Chapter 18: Lawn Soils; Soils And Soil Preparation, Grass Selection And Seeding, Fertilization And Liming, Moving And

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Watering, Chapter 19: Soil Resources; Acreage Of Farm Land In The United States, Acreages Of Aroble Land And Land Requirements, Land Policies Of The United States.

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***soil acidity over time
Addresses the old and new
approaches to humic acids
by comparing the traditional
operational concept against
the currently proposed
supramolecular and***

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***pseudomicellar concept
Proposes soil organics, such
as nucleic acids of DNA and
others, to also adsorb cation
ions held as diffusive ion
clouds around the polymers
Tan explains, in easy and***

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simple language, the chemical make-up of the four soil constituents, their chemical reactions and interactions in soils as governed by basic chemical laws, and their importance

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in agriculture, industry, and the environment. He differentiates soil chemistry from geochemistry and physical chemistry. Containing more than 200 equations, 123 figures, and

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38 tables, this popular text and resource supplies a comprehensive treatment of soil chemistry that builds a foundation for work in environmental pollution, organic and inorganic soil

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contamination, and potential ecological health and environmental health risks.

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to upper-level undergraduate and graduate level courses in soils, pedology and geomorphology. It will also be an invaluable reference text for researchers.